

WHAT IS CLAIMED IS:

- 1      1.       A liquid ejection head, comprising:
  - 2            a chamber formation plate, having a first face formed with a plurality
  - 3            of recesses arranged in a first direction at a fixed pitch, such that each of the
  - 4            recesses is communicated with, via a through hole, a second face which is an
  - 5            opposite face of the first face, the chamber formation plate comprised of nickel;
  - 6            a sealing plate, joined to the first face of the chamber formation plate
  - 7            so as to seal the recesses to form a plurality of pressure generating chambers;
  - 8            and
- 9            a metallic nozzle plate, formed with a plurality of nozzles, and joined
- 10          to the second face of the chamber formation plate such that each of the
- 11          nozzles is communicated with associated one of the pressure generating
- 12          chamber via the through hole,
- 13          wherein a ratio of a grain size of a crystal of the nickel with respect to
- 14          a thickness of a partition wall defined between each adjacent ones of the
- 15          recesses is 60% or less.
- 1      2.       The liquid ejection head as set forth in claim 1, wherein the thickness
- 2        of the partition wall falls within a range of 20 $\mu\text{m}$  to 50 $\mu\text{m}$ .
- 1      3.       The liquid ejection head as set forth in claim 2, wherein the grain size
- 2        is no less than 5 $\mu\text{m}$  and less than 25 $\mu\text{m}$ .

1       4.       The liquid ejection head as set forth in claim 1, wherein a Vickers  
2       hardness of the nickel is no less than 150Hv and less than 190Hv.

1       5.       The liquid ejection head as set forth in claim 1, wherein a ductility of  
2       the nickel is greater than 5% and less than 20%.

1       6.       The liquid ejection head as set forth in claim 1, wherein a ratio of a  
2       height of the partition wall with respect to the thickness of the partition wall falls  
3       within a range of 1.0 to 2.1.

1       7.       The liquid ejection head as set forth in claim 1, wherein a ratio of a  
2       width of each of the recesses with respect to the thickness of the partition wall  
3       falls within a range of 2.0 to 5.0.

1       8.       The liquid ejection head as set forth in claim 1, wherein a ratio of a  
2       depth of each of the recesses with respect to the thickness of the partition wall  
3       falls within a range of 2.0 to 4.5.

1       9.       The liquid ejection head as set forth in claim 1, wherein:  
2               a bottom of each of the recesses has a V-shaped cross section when  
3               viewed from a second direction perpendicular to the first direction; and  
4               an angle between faces forming the V-shaped cross section falls  
5               within a range of 45 degrees to 110 degrees.

1       10.     The liquid ejection head as set forth in claim 1, wherein the fixed pitch  
2     is 0.3mm or less.

1       11.     A method of manufacturing a liquid ejection head, comprising steps  
2     of:

3                 providing a material plate comprised of nickel;  
4                 performing a forging work to form a plurality of recesses in a first face  
5     of the material plate such that each of the recesses is communicated with, via  
6     a through hole, a second face which is an opposite face of the first face;

7                 joining a sealing plate onto the first face of the material plate so as to  
8     seal the recesses to form a plurality of pressure generating chambers; and

9                 joining a metallic nozzle plate formed with a plurality of nozzles, onto  
10    the second face of the material plate such that each of the nozzles is  
11    communicated with associated one of the pressure generating chamber via the  
12    through hole,

13                 wherein a ratio of a grain size of a crystal of the nickel with respect to  
14    a thickness of a partition wall defined between each adjacent ones of the  
15    recesses is 60% or less.

1       12.     The manufacturing method as set forth in claim 11, wherein the step  
2     of providing the material plate includes a step of subjecting raw nickel to a  
3     rolling work.